REMARKS

This is in response to the Office Action mailed on October 26, 2006. In the Office Action, Claims 1-20 were indicated as pending and rejected. With this Amendment, Claims 1, 4-9, 13-17, and 20 are amended, and Claims 1-20 are presented for reconsideration and allowance.

Amendments to the Specification

Applicant has amended the specification to remove the section heading "SUMMARY OF THE INVENTION" from page 3, line 23 of the specification. Applicant has amended the specification to insert a section heading "SUMMARY OF THE INVENTION" at page 6, between lines 8 and 9. This change does not introduce new matter. Entry of the changes to the specification is requested.

Claim Rejections - 35 USC 112

The Examiner rejected Claims 1-20 under 35 USC 112, second paragraph. Claims 1, 4-9, 13-17, and 20 were rejected for reciting "and/or". Claims 5-7, 9, 14, and 16-17 were rejected for reciting the term "in a known way". With this Amendment, the Claims are amended to remove references to "and/or" and "in a known way". Reconsideration of the rejections of under 35 USC 112, second paragraph, and allowance of Claims 1-20 are therefore requested.

Claim Rejections - 35 USC 102

Claims 1-20 were rejected under 35 USC 102(e) as anticipated by LeLeu US 6,088,687. The Examiner indicated that LeLeu disclosed all the limitations of Claims 1-20.

Independent Claim 1, however, includes limitations to a cache node that behaves like a debit node and that includes a debit gateway modifying a payment token assigned to each data packet received". These limitations of Claim 1 are not disclosed by LeLeu.

Independent Claim 20 includes limitations to a cache node that includes a debit gateway allowing a payment token assigned to each data packet received to be modified so as to reduce an initial value of the payment token by an amount representing the cost of a cache operation. These limitations of Claim 20 are not disclosed by LeLeu.

For these reasons, independent Claims 1, 20, as well as dependent claims 2-19 are believed to be novel. Withdrawal of the rejections under 35 USC 102 and allowance of Claim 1-20 are therefore requested. There are also other features of the embodiments that are not taught by LeLeu described in more detail below.

In the Applicant's Specification at page 3 line 14, mention is made of "WO 9733404 LELEU". The disclosure of WO 9733404 is fully the same as the disclosure of LELEU US 6,088,687. The Examiner has thus based the present rejections under 35 USC 102 on a prior art document which is discussed in the present application as a problem that one or more of the present embodiments improves upon.

The presently disclosed embodiments relate to a payment process and system for operations within a data packet transmission network, and particularly, but not exclusively, Internet type networks.

In the Applicant's specification, starting at mid-page 2, the prior art Leleu patent document is discussed. As explained in the specification, it seems difficult, if not impossible, to implement conventional payment technologies on the Internet network for operations carried out on the networks. Indeed the Internet network does not have the centralized administration necessary to implement these conventional payment technologies, which mainly comprise billing as a function either of the length of connection between units (for a preset data transmission speed and distance), or of the amount of data exchanged between two units (taking into account the data transmission speed).

For this reason, the current technology of paying for operations carried out on the Internet network comprises billing only for access at a physical point on the network. As shown in Leleu patent document, this billing is either at a flat-rate, or it takes into account the amount of data sent to the whole network, or else the totality of the data received from the totality of the network.

Unfortunately, this prior art payment technology does not allow fair and equitable billing of transmission or service operations carried out within the Internet network. Indeed, currently, the billing of transmission or service operations is not a function of the path traversed

by and of the transmission speed of the data packets.

Therefore, in the Leleu reference, a technology ("token technology") is introduced that is based on the insertion of payment tokens in the packet stream and allows each data packet conveyed by the network to settle for itself the cost of a transmission operation relating to its own transport, or the cost of a service operation relating to its own container or content.

The general design of existing token technology is described in our application from page 3, line 24 to page 5 line 6. As explained there, this token technology has numerous advantages. In particular, it allows fair and equitable billing of transmission and/or service operations carried out within a data packet transmission network, for example of the Internet type. It may also constitute an electronic payment process, associated with the content of the packets, in the network nodes. Indeed, the payment token assigned to each data packet makes it possible to finance any type of operation (transport and/or service) carried out by the destination unit or any network node in which the packet will reside.

However, the token technology, as taught by LeLeu, has the major drawback of not covering the situation, which is, however, increasingly frequent, where a cache unit is located, within the network, between the unit including the credit gateway (source unit or credit node) and the unit including the debit gateway(destination unit or debit node).

Conventionally, a cache unit (also called a cache node) stores responses (web pages, in the case of the Internet) to the most frequent requests to different end sites. Thus, when it receives a request for which it has previously stored the response, the cache unit itself sends the response to the customer sending said request. In this way the number of requests actually passed on to the end sites is restricted, and response times are therefore reduced. Typically, the cache unit is a "proxy" server.

Token technology, as taught by LeLeu, makes no provision however in the situation where a cache unit carries out one or more operations on behalf of another unit (destination unit or debit node) located downstream. This function that the debit gateway included in this other unit never receives some data packets (corresponding to requests not passed on to the end sites), and especially does not receive the payment tokens assigned to the

latter. In other words, it was impossible to apply token technology when a cache unit is used. an embodiment of the present disclosure overcomes this major drawback of this prior art.

To be more exact, an embodiment of the present disclosure provides a payment process and system constituting an efficient improvement on the LeLeu token technology discussed just above, so that the latter may be applied even when a cache unit is used.

An embodiment of the present disclosure provides such a payment process and system, allowing the replaced unit or node (destination unit or debit node) to be informed about and to control the collection of tokens which are intended for it, even though it does not carry out this collection itself.

An embodiment of the present disclosure provides such a payment process and system, including a service continuity test mechanism.

These functions, and others which will emerge subsequently, are met according to an embodiment of a payment process for transmission and/or service operations carried out within a data packet transmission network, during a session between a source unit and a destination unit interconnected via at least one node of said network, said destination unit and/or said at least one node being used by at least one operator and/or at least one service provider. The process is of the type implementing token technology as mentioned above.

According to certain aspects, between said source unit and said destination unit, at least one node is used as a cache node, including caching that allows at least one cache operation to be carried out, on behalf of at least one replaced unit or node, namely said destination unit or at least one node, located downstream of said at least one cache node. Furthermore, said at least one cache node also behaves like a debit node, and includes a said debit gateway modifying the payment token assigned to each data packet received so as to reduce said initial value of the payment token, by an amount representing the cost of said at least one cache operation carried out, for said packet received, by said cache node. Lastly, a manager of said at least one cache node receives from said toll center, for each packet received during said session, said financial settlement of said representative amount and restores it to a manager of said at least one replaced unit or node, or allows a manager of said at least one replaced unit or node to receive directly

said financial settlement.

The general principles comprise including in the cache node a debit gateway which replaces, for the collection of tokens, the debit gateway of the replaced unit or node. A financial settlement of tokens thus collected may be requested from the toll centre, to the advantage (directly or via the cache node) of the replaced unit or node.

In this way, the tokens may be collected even though they do not quite reach the replaced unit or node. In other words, certain aspects of the embodiments allow token technology to be applied even though a cache unit is used.

In addition to the features described above, there are further advantages that can be seen in the embodiments.

LeLeu describes a mechanism where an end-user knowing the total price of a service associated to a packet, can send a packet with a token containing some pieces of data, that can be extracted by the different devices involved in the processing of a packet, in order to be compensated by a centralized system. But, LeLeu presents several important limitations such as the following:

- the token carries only a numerical value of a credit, but no information about the user or the expected service,

- most services charges cannot be derived from the content of a packet. So additional information is required to determine what needs to be charged. (profile, bonus, client identifier, ...),

- in most networks and in Internet in particular, a packet does not allow to identify an end-user, nor all the devices traversed, so no error handling mechanism can rely solely on a packet and the associated numerical value.

Unlike LeLeu, the embodiments enrich the token with a bit of information that allows charging the end-user with more complex charging model than the sole metering scheme that is the target of Leleu disclosure, an in effect the only model his disclosure allows for.

In addition, the following is noted concerning LeLeu's teachings:

From column 2, line 3, to column 3, line 12, Leleu describes how a data packet

carried on a network pays for its transmission cost, or the cost of services and operations associated to the packet. For this very reason, the embodiment relies on the transmission with the packet of a "toll token" which carries (col.2, line 10) a numerical value that can be authenticated, and which is difficult to forge.

The various devices traversed are expected to validate the packet and to modify the token in such a way that they reduce its value. The provider can later on derive some revenue from a centralized system which provides the basic components of the token to the end user who sends the packet in the first place.

Also, column 2, line 50, we can read that the device or system, can calculate the value corresponding to the toll-unit credit as a function of the destination address of the packet.

In that case, it is clear that this entails the end-user must be able to compute in advance the price of the service. This view corresponds to the initial metering model that the author has in mind. Data services have more complex charging mechanisms where the charge associated to a transaction (some type of processing triggered by the packet) can depend on many other parameters such as customer profile, time of day, accumulated bonus).

As already explained the purpose of our improvement to disclosure of Leleu patent, is to allow a Token Based charging system to perform those types of charging as well. For this, we suggest to include in the Token itself some associated information which will allow the various devices to compute which price they must apply based on the nature of this associated extra information.

From column 3, line 50 to column 4, line 5, it is clearly stated that different types of operations can be charged according to Leleu disclosure. We never claim this; our key point is that such systems (for example, charging for Java code execution as given in the example at column 12, line 15) usually need more information than what is included in a packet itself to derive what is to be charged. Including a piece of information in the packet helps to determine what must be charged and this is a definite advantage as it removes the burden on the end-server to initiate a request to the network operator to find out about this information directly.

It should be noted in addition that a single data packet does not usually allow an

end server to identify the initial sender of this packet let alone because of the network operator firewalls. So we can see that without additional information carried in the token as claimed in our application, no customer specific charging can be done.

At column 4, lines 20-55, we can see, in particular at line 31, confirmation that for Leleu, the credit amount to be included in the packet must correspond to the cost of the operations to be performed on the data packet. This is reinforced at column 10, line 28, where it is said that the packet arrives with a token containing more credit that it can debit, then an error must be sent back.

Here we see an actual key limitation of Leleu disclosure. As the end-server is unable to identify the source of the transaction (which he takes money from), he must have an error mechanism in case the money sent does not exactly cover the expected price. In addition it should be noted that there is no protocol described in Leleu document suggesting how this error handling system could operate. For example, in the Internet, not a packet (or the information in the Token) contains any information allowing an end-system to know who is the sender of the packet, nor what are the intermediate devices that the packets traversed before arriving to the end-server. This is obviously a major issue in the embodiments proposed by Leleu. As a matter of fact, when you send money, there is no way to get your money back in case of problem, nor to know what element in the chain of devices caused the transaction to abort (hence no way to know who to complain to).

Column 6, line 58, to column 8, line 37 and column 9, line 30 to column 10, line 50, describe in detail the operation of Leleu disclosure, without addressing the issue identified above.

In addition to the need to include a piece of information in a packet to give enough information to all intermediate devices to compute a price, we clearly state that the end user does not need to provide the exact amount of the transaction.

With some information in the packet, the end-server can either charge more or less than what is included in the packet, using the information to collect money from an account, or getting back to the operator based on the included information.

Furthermore, we claim that the end-server can also use the information added to the token to adapt the content to the end-user. An example could be to change the quality of a delivered video service, based both on the token information and the credit value included.

Concluding Remarks

The Application appears to be in condition for allowance and favorable action is requested. The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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